

Wet Bulb Globe Temperature provision in the National Digital Forecast Database (NDFD)

Product Description Document May 3rd, 2019

Part I – Mission Connection

- a. Description of Product – Under statute, the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) is charged to provide forecasts and warnings of severe weather in order to protect life and property, and create and disseminate forecasts and other weather information for the benefit of a wide range of weather sensitive businesses and activities. Heat is a major weather-related killer, and therefore deserves the utmost attention. According to the Occupational Safety and Health Administration (OSHA), 2,630 workers suffered from heat illness and 18 died from heat stroke and related causes on the job in 2014. The National Center for Catastrophic Sports Injury Research found that 52 football players died over the period 1995 to 2012 from exertional heat stroke (EHS). While the legacy heat index is useful for sedentary populations, it does not appropriately address Exertional Heat Illness (EHI) and Exertional Heat Stroke (EHS) threats. Based upon engagement with core partners, particularly Emergency Management Officials, the NWS has identified the need to provide forecasts of a parameter that will address heat risk to active persons. The Wet Bulb Globe Temperature (WBGT) is a composite parameter that estimates the effect of temperature, humidity, wind chill, and solar radiation on humans. WBGT is becoming an increasingly needed parameter by partners in Decision Support Service (DSS) activities and research proves it is a more effective means of assessing heat risk to persons involved in physical activity.
- b. Purpose - The National Digital Forecast Database (NDFD) is the primary means by which the NWS provides digital information to customers and partners. The NWS is providing gridded forecasts of WBGT to the NDFD on an experimental basis for the contiguous United States (CONUS) in response to user needs for planning purposes and critical decisions related to heat safety.
- c. Intended Audience – The intended audience for the NDFD WBGT grids includes emergency managers, government agencies, military, athletic associations, recreational users, and large volume users of forecast information.
- d. Presentation Method – The domain for provision of NDFD WBGT grids will be the CONUS. The data will have an hourly temporal resolution out to seven (7) days for the domain.

Experimental WBGT forecasts at 3 km will be available in graphical format via the web. Images can be accessed via a mouse click under the initial map for the CONUS that is displayed at the following URL: <http://digital.weather.gov>

WBGT will also be an available parameter on the Hourly Weather Forecast and Tabular Forecast (which are generated from the NDFD grids).

A user defined GRIB2 access method is also available. This service allows the user to provide latitude/longitude points for two corners and a weather element. A resulting GRIB2 message is built “on-the-fly” and downloaded by the user. For more information about User Defined GRIB2 access, please refer to the Products/Service Description Document at the following URL:
https://www.weather.gov/mdl/degrib_home

e. Feedback Mechanism –

Feedback via the following electronic survey will be accepted through mm/dd/yyyy at the following link:

In addition, questions related to WBGT can be directed to:

Lisa Schmit
National Weather Service
1733 Lake Drive West
Chanhassen, MN 55317
(952) 361-6671
lisa.schmit@noaa.gov

For general questions regarding the National Digital Forecast Database, please email:
nws.ndfd@noaa.gov

Part II - Technical Description

a. Format & Science Basis - The NDFD forecast element definitions and technical information (e.g. temporal and spatial resolution of the graphics, and geographic coverage) may be found on the NDFD technical page at the following URL:
https://www.weather.gov/mdl/ndfd_home

b. Product Availability – Experimental NDFD WBGT forecasts are available via file transfer protocol (ftp) or web browser. For further availability and technical information (e.g., temporal and spatial resolutions, forecast projections, and geographic coverage) please visit the following URL:
https://www.weather.gov/mdl/ndfd_data_grid

Experimental WBGT images may also be accessed from the NWS homepage,

digital.weather.gov

c. Additional Information – For more information on the NDFD, please refer to the NDFD Information web site at the following URL:

https://www.weather.gov/mdl/ndfd_home

For more information on the WBGT and how it is calculated, please refer to the following paper:

<https://www.weather.gov/media/tsa/pdf/WBGTpaper2.pdf>